

International Journal of Civil Engineering and Geo-Environmental

Journal homepage: <http://ijceg.ump.edu.my>

ISSN:21802742

Bending Behavior of Semi-Continuous Prefabricated Profiled Steel Sheeting (PSSDB) Floor Panels

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ARTICLE INFO

Keywords:
Prefabricated
Bending
Stiffness
Dryboard
Steel sheeting

ABSTRACT

Profiled Steel Sheeting Dry Board (PSSDB) floor panel is a composite of dry board and profiled steel sheeting screwed together by means of self-tapping, self-drilling shear connectors. The system has been successfully implemented in many Malaysian construction projects. Recently, the PSSDB system has been expanded to be an easy to assemble prefabricated floor for rural school cabin construction. An innovative prefabricated panel consists of three PSSDB parts which are then screwed together on site to form a semi-continuous panel has been proposed. This paper describes the three distinct parts of the panel, their assembly and the experiment to study the bending behavior of the panel. The semi-continuous panel performance was also compared to that of a continuous panel. All together, six 3.0 m span samples were tested under a uniformly distributed load until failure. The semi-continuous panels showed a two-phase behavior whilst the continuous panels showed a three-phase behavior under loading which were related to the time of cracking of the dry board and the buckling of the profiled steel sheeting. The mid span deflections were recorded and used to determine the stiffness of the panels. Results showed that the stiffness of the semi-continuous panels were half of that of the continuous panels. It can be concluded that the discontinued spanning of the profiled steel sheeting has severely reduced the overall semi-continuous panel stiffness. The 25 screws used in the 0.6 m middle connecting panel had shown to be quite insufficient to hold the whole semi continuous panel together. Therefore, the addition of screws with closer spacing is recommended to increase the panel stiffness.

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